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National Aeronautics
and Space Administration

April 5, 1996
NRA 96-OSS-07

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RESEARCH ANNOUNCEMENT

INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY RESEARCH AND ANALYSIS PROGRAM

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Letters of Intent Due: May 10, 1996

Proposals Due: July 5, 1996

QA 0830-H-05 96-020283

THE INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY RESEARCH AND ANALYSIS PROGRAM

Scope

This program is intended to support research activities relevant to NASA Infrared, Submillimeter, and Radio (ISR) Astronomy flight programs. In addition to the basic scientific and technical merit of the proposed research, its relevance to the ISR Astronomy flight programs, both existing and planned, will be a significant factor in the evaluation process. A summary of the scientific goals of the ISR Astronomy program is provided below.

This NRA solicits proposals in support of scientific investigations of cosmic phenomena via observations of their radiation in the infrared and submillimeter (1 - 1000 μm) and radio wavelength spectral regimes. These investigations are expected to involve the design, development, and testing of detector and/or instrument concepts and/or the use of such instrumentation on high-altitude balloons or sounding rockets. Laboratory astrophysics investigations involving atomic, molecular, and solid state spectroscopy are also encouraged.

Investigations that primarily involve theoretical studies, the analysis of archival data from past NASA missions, instrument development or data analysis pertinent to the Airborne Astronomy Observation Program **are not** solicited by this Announcement.

Priority will be given to proposed work that has overall scientific and technical merit and is shown to be of direct relevance to ongoing or planned NASA projects and cooperative missions such as: Infrared Space Observatory (ISO), Submillimeter Wave Astronomical Satellite (SWAS), Space Very Long Baseline Interferometry (SVLBI), Two-Micron All-Sky Survey (2MASS), Wide-Field Infrared Explorer (WIRE), Stratospheric Observatory for Infrared Astronomy (SOFIA), Space Infrared Telescope Facility (SIRTF), and the newly-defined Astronomical Search for Origins and Planetary Systems Program ("Origins"). Two of the elements of the Origins Program may eventually include an Exploration of Neighboring Planetary Systems (ExNPS) near- to mid-infrared interferometer/spectrometer designed to detect and characterize Earth-like planets, and a near-infrared/visible Next Generation Space Telescope (NGST).

The total funding available for the consolidated Research and Analysis (R&A) programs encompassed by this solicitation is presently expected to be approximately $5 million for each of the fiscal years 1997 through 1999. There are no restrictions on the level of funding that may be requested for an investigation under this program.

Program Duration and Proposal Schedule

The Infrared, Submillimeter, and Radio Astronomy R&A Program is a continuing program. Proposers are encouraged to define a program that may be accomplished in a three-year period. It is recognized that the proposed investigation may evolve with time. Accordingly, emphasis should be placed upon the first year's effort, with as much detail as possible provided relevant to the planned second- and third-year's activities. Similarly, a detailed budget corresponding to the first-year program is required, together with as reliable an estimate as feasible of the projected budget for the subsequent years. It should be recognized that NASA can only commit financial support on an annual basis. Proposals for investigations requiring less than a three-year time scale to complete are also acceptable.

To facilitate planning for the peer review process, individuals who intend to submit proposals in response to this solicitation should submit a Letter of Intent, via electronic or regular mail, by May 10, 1996 (see Appendix C for more details).

The ISR Astrophysics Flight Program

The Infrared and Radio Astrophysics Branch administers a program of space-based missions and suborbital investigations in the areas of infrared, submillimeter, and radio astronomy. The ISR Astronomy program is directed toward investigations of astrophysical objects and phenomena as revealed by their radiation characteristics over the wavelength range 1 μm to 1000 μm (1 millimeter), and extending decades more into the radio wavelengths from 1 cm to > 10 m. Wavelengths longer than 1 μm hold the key to the origins of all the major structures in the universe by revealing the formation of solar systems and stars, probing the complex chemistry of the interstellar matter, uncovering the genesis of normal and active galaxies as well as of quasars, and mapping the overall distribution of matter in the universe following the Big Bang.

Two inescapable facts account for much of the importance of infrared and submillimeter astrophysics. First, the Hubble expansion makes the infrared the premier spectral band for the study of the large-scale structure of the early universe. Second, the absorption of optical and ultraviolet radiation by interstellar dust, and the reradiation of that energy by warm dust at long wavelengths, make infrared observations essential to uncovering the physical processes that govern the formation of stars and planets in the visually obscured cores of molecular clouds and produce the high luminosities seen in the centers of active galaxies. To answer the fundamental questions of evolution and origin, different space observatories that emphasize various combinations of high sensitivity, high spatial resolution, and high spectral resolution throughout the broad wavelength range are required.

A compilation of relevant NASA flight programs and collaborative international programs in the discipline of Infrared, Submillimeter, and Radio Astronomy is provided in Appendix D, and typical research areas presently supported within the ISR Astronomy R&A program are listed in Appendix E. Appendix F contains the cover form and endorsement form, and three certification pages, each of which must be completed and enclosed with submitted proposals. Failure to enclose the certifications will introduce delays in the procurement process for successful proposers.

Additional Program Information

NASA's Infrared, Submillimeter, and Radio Astronomy Research and Analysis Program is managed within the Research Program Management Division, Code SR, of the Office of Space Science, National Aeronautics and Space Administration, Washington, DC 20546-0001.

Questions regarding proposal format, evaluation procedures, or requests for further general information concerning the ISR program should be referred to:
Dr. Michael D. Bicay, Research Program Management Division, Code SR,
phone: 202-358-0376, *Email:* mbicay@hq.nasa.gov.

Appendix B
NRA-96-OSS-07

GUIDELINES FOR RESPONDING TO

NASA RESEARCH ANNOUNCEMENTS (NRA)

FOR SOLICITED BASIC RESEARCH PROPOSALS

JUNE 1995

OFFICE OF PROCUREMENT
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, DC 20546

INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS (JUNE 1995)

1. Foreword

a. These instructions apply to "NASA Research Announcements." The "NASA Research Announcement (NRA)" permits competitive selection of research projects in accordance with statute while preserving the traditional concepts and understandings associated with NASA sponsorship of research.

b. These instructions are Appendix I to 1870.203 of the NASA Federal Acquisition Regulation Supplement.

2. Policy

a. Proposals received in response to an NRA will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA to be used as the basis of a solicitation or in negotiation with other organizations, nor is a preaward synopsis published for individual proposals.

b. A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

3. Purpose

These instructions supplement documents identified as "NASA Research Announcements." The NRAs contain programmatic information and certain requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NRAs.

4. Relationship to Award

a. A contract, grant, cooperative agreement, or other agreement may be used to accomplish an effort funded in response to an NRA. NASA will determine the appropriate instrument.

b. Grants are generally used to fund basic research in educational and nonprofit institutions, while research in other private sector organizations is accomplished under contract. Contracts resulting from NRAs are subject to the Federal Acquisition Regulation and the NASA FAR Supplement (NHB 5100.4). Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NHB 5800.1).

5. Conformance to Guidance

a. NASA does not have mandatory forms or formats for responses to NRAs; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

b. To be considered responsive, a submission must, at a minimum, present a specific project within the areas delineated by the NRA; contain sufficient technical and cost

information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

6. NRA-Specific Items

Several proposal submission items appear in the NRA itself: the unique NRA identifier; when to submit proposals; where to send proposals; number of copies required; and sources for more information. Items included in these instructions may be supplemented by the NRA.

7. Proposal Contents

a. The following information is needed to permit consideration in an objective manner. NRAs will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter if it contains substantive information.

b. **Transmittal Letter or Prefatory Material.**

(1) The legal name and address of the organization and specific division or campus identification if part of a larger organization;

(2) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;

(3) Type of organization: e.g., profit, nonprofit, educational, small business, minority, women-owned, etc.;

(4) Name and telephone number of the principal investigator and business personnel who may be contacted during evaluation or negotiation;

(5) Identification of other organizations that are currently evaluating a proposal for the same efforts;

(6) Identification of the NRA, by number and title, to which the proposal is responding;

(7) Dollar amount requested, desired starting date, and duration of project;

(8) Date of submission; and

(9) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization (unless the signature appears on the proposal itself).

c. **Restriction on Use and Disclosure of Proposal Information.** Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following notice on the title page of the proposal and specify the information subject to the notice by inserting appropriate identification, such as page numbers, in the notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

Notice

Restriction on Use and Disclosure of Proposal Information. The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or

other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

d. **Abstract.** Include a concise (200-300 word if not otherwise specified in the NRA) abstract describing the objective and the method of approach.

e. **Project Description.**

(1) The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance; relation to the present state of knowledge; and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the plan of work, including the broad design of experiments to be undertaken and a description of experimental methods and procedures. The project description should address the evaluation factors in these instructions and any specific factors in the NRA. Any substantial collaboration with individuals not referred to in the budget or use of consultants should be described. Subcontracting significant portions of a research project is discouraged.

(2) When it is expected that the effort will require more than one year, the proposal should cover the complete project to the extent that it can be reasonably anticipated. Principal emphasis should be on the first year of work, and the description should distinguish clearly between the first year's work and work planned for subsequent years.

f. **Management Approach.** For large or complex efforts involving interactions among numerous individuals or other organizations, plans for distribution of responsibilities and arrangements for ensuring a coordinated effort should be described. Intensive working relations with NASA field centers that are not logical inclusions elsewhere in the proposal should be described.

g. **Personnel.** The principal investigator is responsible for supervision of the work and participates in the conduct of the research regardless of whether or not compensated under the award. A short biographical sketch of the principal investigator, a list of principal publications and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in evaluation of the proposal. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry-university cooperative arrangements should be described.

h. **Facilities and Equipment.**

(1) Describe available facilities and major items of equipment especially adapted or suited to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tooling that are proposed for use.

(2) Before requesting a major item of capital equipment, the proposer should determine if sharing or loan of equipment already within the organization is a feasible alternative. Where such arrangements cannot be made, the proposal should so state. The need for items that typically can be used for research and non-research purposes should be explained.

i. **Proposed Costs.**

(1) Proposals should contain cost and technical parts in one volume: do not use separate "confidential" salary pages. As applicable, include separate cost estimates for salaries and wages; fringe benefits; equipment; expendable materials and supplies; services; domestic and foreign travel; ADP expenses; publication or page charges; consultants; subcontracts; other miscellaneous identifiable direct costs; and indirect costs. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants, and technicians and other

non-professional personnel). Estimate all manpower data in terms of man-months or fractions of full-time.

(2) Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired; purpose and estimated number and lengths of trips planned; basis for indirect cost computation (including date of most recent negotiation and cognizant agency); and clarification of other items in the cost proposal that are not self-evident. List estimated expenses as yearly requirements by major work phases. (Standard Form 1411 may be used).

(3) Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 1831 (and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

j. **Security.** Proposals should not contain security classified material. If the research requires access to or may generate security classified information, the submitter will be required to comply with Government security regulations.

k. **Current Support.** For other current projects being conducted by the principal investigator, provide title of project, sponsoring agency, and ending date.

l. **Special Matters.**

(1) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(2) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal. Identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

8. Renewal Proposals

a. Renewal proposals for existing awards will be considered in the same manner as proposals for new endeavors. A renewal proposal should not repeat all of the information that was in the original proposal. The renewal proposal should refer to its predecessor, update the parts that are no longer current, and indicate what elements of the research are expected to be covered during the period for which support is desired. A description of any significant findings since the most recent progress report should be included. The renewal proposal should treat, in reasonable detail, the plans for the next period, contain a cost estimate, and otherwise adhere to these instructions.

b. NASA may renew an effort either through amendment of an existing contract or by a new award.

9. Length

Unless otherwise specified in the NRA, effort should be made to keep proposals as brief as possible, concentrating on substantive material. Few proposals need exceed 15-20 pages. Necessary detailed information, such as reprints, should be included as attachments. A complete set of attachments is necessary for each copy of the proposal. As proposals are not returned, avoid use of "one-of-a-kind" attachments: their availability may be mentioned in the proposal.

10. Joint Proposals

a. Where multiple organizations are involved, the proposal may be submitted by only one of them. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

b. Where a project of a cooperative nature with NASA is contemplated, describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. The proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

11. Late Proposals

A proposal or modification received after the date or dates specified in an NRA may be considered if the selecting official deems it to offer NASA a significant technical advantage or cost reduction.

12. Withdrawal

Proposals may be withdrawn by the proposer at any time. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

13. Evaluation Factors

a. Unless otherwise specified in the NRA, the principal elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's objectives, intrinsic merit, and cost.

b. Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to NASA's mission.

c. Evaluation of its intrinsic merit includes the consideration of the following factors, none of which is more important than any other:

(1) Overall scientific or technical merit of the proposal or unique and innovative methods, approaches, or concepts demonstrated by the proposal.

(2) Offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.

(3) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives.

(4) Overall standing among similar proposals and/or evaluation against the state-of-the-art.

d. Evaluation of the cost of a proposed effort includes the realism and reasonableness of the proposed cost and available funds.

14. Evaluation Techniques

Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house, others are evaluated by a combination of in-house and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of-interest and protection of proposal information), such as by mail or through assembled panels. The final decisions are made by a NASA selecting official. A proposal which is scientifically and programmatically meritorious, but not selected for award during its initial review, may be included in subsequent reviews unless the proposer requests otherwise.

15. Selection for Award

a. When a proposal is not selected for award, and the proposer has indicated that the proposal is not to be held for subsequent reviews, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

b. When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model contract and other information which will be of use during the contract negotiation.

16. Cancellation of NRA

NASA reserves the right to make no awards under this NRA and to cancel this NRA. NASA assumes no liability for cancelling the NRA or for anyone's failure to receive actual notice of cancellation. Cancellation may be followed by issuance and synopsis of a revised NRA, since amendment of an NRA is normally not permitted.

ADDITIONAL GUIDELINES FOR THE PREPARATION OF PROPOSALS IN RESPONSE TO THIS NRA, AND A DESCRIPTION OF THE EVALUATION AND SELECTION PROCESS

The information contained in Appendix C augments/supersedes Appendix B and is applicable only to NRA 96-OSS-07.

Letter of Intent to Propose

To facilitate planning for the proposal evaluation process and the timely selection of a scientific peer review panel, it will be useful if prospective investigators intending to submit proposals for participation in this program notify NASA by **May 10, 1996**. A letter of intent containing the name and affiliation of the Principal Investigator and all Co-Investigators, should be sent by either regular or electronic mail to: Dr. Michael D. Bicay, Research Program Management Division Code SR, National Aeronautics and Space Administration, 300 E Street SW, Washington, DC 20546-0001 (mbicay@hq.nasa.gov). The letter should summarize the primary research areas and objectives of the proposed investigation.

Proposal Format and Content

A uniform proposal format is recommended to aid in proposal evaluation. Proposals:

1. Must contain a scientific and technical (as appropriate) description of the investigation and a cost plan;

2. For investigators presently supported under this program, should include a discussion of past grant-related performance;

3. Must include a **complete** listing of all awarded or pending research funding support from NASA or other sources for the Principal Investigator and all co-Investigators; and

4. **Must** be accompanied by institutional certifications expressing compliance with Federal regulations regarding lobbying, debarment and suspension, and drug-free workplace (see templates in Appendix F) and the signature of an institutional official with the authority to contractually bind the institution.

Limits on Proposal Length

Proposals are limited to a maximum of **25 pages,** *including* the abstract, text body, figures, tables, references, vitae, and selected bibliography. Not included in this page limit are (i) the completed cover page and endorsement page, and the three certification pages referred to above (see Appendix F), and (ii) the detailed budget information (see below). All proposers are encouraged to submit double-sided sheets of paper, in which case each side containing text or figures is considered as counting toward the page limit. Reviewers will be instructed to disregard any portions of the proposal that exceed 25 pages. Reprints or preprints should not be included; where appropriate, such work should be summarized in the body of the proposal. The text should be of 10-point font or larger and should have one-inch margins on 8-1/2 inch x 11 inch paper.

In an effort to assist in the recycling of proposals following the review process, please submit all proposals and copies on plain, white paper only (*e.g.*, no cardboard stock or plastic covers, no colored paper, etc.).

Guidelines for the Budget Section of Proposals

Budgets for each of the years (FY 1997-1999) for which proposals seek funding must be included in the proposal. Details provided by the offeror will be used by the Government to evaluate costs. Each significant category of costs should be explained to an extent that will allow the Government to understand the basis of the estimates. Offerors should exercise prudent judgment regarding the amount of detail necessary.

The number and nature of the appropriate cost categories will depend on the particular plan for each proposed investigation. Guidelines depicting the level of detail requested for typical categories are provided below.

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Labor Costs

Labor costs should be segregated by titles or disciplines; *e.g.*, Principal Investigator, Co-Investigator, other professionals (including technicians and programmers), postdoctoral associates, graduate and undergraduate students, and clerical staff. Details should include estimated hourly or monthly rates, and estimates of the level of effort expected to be charged to the proposed investigation. Labor rates should be based on current rates, or on outstanding offers to prospective employees. This format allows the Government to assess cost reasonableness by various means, including a comparison with similar skills at other comparable organizations. Fringe benefits should be specified, with percentages and base salaries (when applicable) listed.

Equipment Costs

Proposed equipment purchases should specify the type of equipment, number of units requested, unit cost, and total cost.

Travel Costs

Requested travel allowances should include the destination, number of travelers, estimated airfare and per diem expenses, and the number of days for which support is requested.

Other Direct Costs

Other applicable cost categories include purchase of expendable materials and supplies, computer services, communications costs, and publication expenses.

Indirect Costs

Indirect costs should be explained to an extent that will allow the Government to understand the basis for the estimates. Examples of prior year historical rates, current variances from those rates, or an explanation of other basis of estimates should be included. Where costs are based on allocation percentages or dollar rates, an explanation of rate and application base relationships should be given. For example, the base to which the General and Administrative (G&A) rate is applied should be explained as: "application base equals total costs before G&A, less subcontracts."

Current and Pending Support

Each proposal must contain a summary of current and pending support of all projects with substantial involvement of the PI and each Co-I for whom support is requested. The required information should include: funding agency, grant/contract number, project title, amount awarded/expected in FY 1997, level of effort (percent), and the award period and total amount requested.

Proposal Submission Information

Twenty (20) copies of each proposal should be submitted to the following address no later than **July 5, 1996**:

Infrared, Submillimeter, and Radio Astronomy R&A Program
Code SR-2
400 Virginia Avenue SW, Suite 700
Washington, DC 20024
ATTN: Ms. Susan Borden
202-554-2775 (x 114)

Guidelines for Foreign Participation

Participation in this program is open to all categories of domestic and foreign organizations. Proposals from non-U.S. entities are on a "no exchange of funds" basis and, therefore, should not include a cost plan. Non-U.S. proposals and U.S. proposals that include non-U.S. participation must be endorsed by the respective government agency or funding/sponsoring institution in that country from which the non-U.S. participation is proposing. Such endorsement should indicate that: (i) the proposal merits careful consideration by NASA; and (ii) if the proposal is selected, sufficient funds will be made available to undertake the activity proposed.

In addition to the 20 copies (including signed original) of the proposals to be sent to the address specified above, non-U.S. proposers must forward one copy of the proposal and a Letter of Endorsement to the following address:

Ms. Shiron D. Gaines
NRA 96-OSS-07
International Relations Division, Code IRD
NASA Headquarters
300 E Street SW
Washington, DC 20546-0001 USA

All proposals must be typewritten in English. All non-U.S. proposals will undergo the same evaluation and selection process as those originating in the U.S. Non-U.S. proposals and U.S. proposals that include foreign participation must follow all other guidelines and requirements described in this NRA. Sponsoring non-U.S. agencies may, in exceptional situations, forward a proposal without endorsement to the above address, if review and endorsement is not possible before the announced closing date. In such cases, however, NASA's International Relations Division should be advised when a decision on endorsement can be expected.

Successful and unsuccessful proposers will be contacted directly by the NASA Research Program Management Division. Copies of these letters will be sent to the sponsoring government agency.

Should a non-U.S. proposal or a U.S. proposal with non-U.S. participation be selected, NASA's International Relations Division will arrange with the non-U.S. sponsoring agency for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency will each bear the cost of discharging its respective responsibilities. Depending on the nature and extent of the proposed cooperation, these arrangements may entail a letter of notification by NASA and/or an exchange of letters between NASA and the sponsoring governmental agency.

Evaluation and Selection Process

The scientific and technical merits of proposals will be evaluated by a scientific peer review panel. The highest rated proposals will then be considered in the overall funding availability and programmatic needs. Final selection will be made by the Director, Research Program Management Division, Office of Space Science.

The following NRA-specific evaluation criteria, listed in descending order of importance, will be used in evaluating proposals for investigations within the Infrared, Submillimeter, and Radio Astronomy R&A Program (note these criteria supersede those cited in Appendix B):

1. The overall scientific and technical merit of the investigation.
2. The relevance of the proposed research to NASA's ISR Astronomy program.
3. The realism of, reasonableness of, and total cost for the proposed research.

4. The competence and relevant experience of the Principal Investigator and any collaborators as an indication of their ability to carry the investigation to a successful conclusion within the requested resources, including timely publication of peer-reviewed journal articles. Past performance of the investigators relevant to work conducted under previous NASA ISR Astronomy grants, if applicable, will be considered.

Note: NASA may desire to select only a portion of a proposer's investigation, in which case the investigator will be given the opportunity to accept or decline such partial acceptance.

Individuals responding to this Announcement will be notified of the outcome of the proposal selection process by a relevant Discipline Scientist in the area of Infrared/Submillimeter/Radio Astrophysics within the Research Program Management Division. It is currently expected that official notifications of acceptance or rejection will be made in September 1996, at which time, in the case of those investigations recommended for selection, discussions of the specific terms under which the investigation will be implemented will be initiated.

Schedule

The schedule of planned activities for the present review cycle of the Infrared, Submillimeter, and Radio Astronomy R&A program is shown below.

Letters of Intent due	May 10, 1996
Deadline for Proposal Submission	**July 5, 1996**
Peer Review	August 1996
Proposal Selections	September 1996
Initiation of Funding	October 1996 or thereafter

While the above plan represents NASA's intent, it should be realized that future circumstances and events could result in modifications of this schedule.

Appendix D
NRA 96-OSS-07

INFRARED, SUBMILLIMETER, AND RADIO ASTRONOMY FLIGHT PROGRAMS

PROGRAM	PRIMARY FUNCTION / DATES
Balloon Science	Ongoing multipurpose short lead-time observations/instrumentation development.
Infrared Space Observatory (ISO) §	High-sensitivity imaging and spectroscopy with 60 cm cooled telescope (cooperative mission with ESA). Launched in November 1995; operational through 1997.
Near Infrared Camera and Multi-object Spectrometer (NICMOS)	High spatial resolution 1-2.5 μm measurements using the Hubble Space Telescope. To be installed in early 1997 HST servicing mission.
Space Infrared Telescope Facility (SIRTF) ¶	Exceptionally high sensitivity orbiting great observatory. Currently baselined for flight in ~2002.
Space Very Long Baseline Interferometry (SVLBI) §	Increased spatial resolution for radio astronomy (cooperative missions with Japan [VSOP] and with Russia [RadioAstron]). VSOP scheduled for late 1996 launch.
Stratospheric Observatory for Infrared Astronomy (SOFIA) ¶	Multipurpose high spectral and spatial resolution short lead time measurements, with routine flights beginning in ~2000 (cooperative mission with Germany).
Submillimeter Wave Astronomy Satellite (SWAS)	Initial measurements from space of H_2O, O_2, C I, and CO in the Galaxy. A Small Explorer (SMEX) mission scheduled for launch in 1996.
Wide-field Infrared Explorer (WIRE)	SMEX mission devoted to the study of starburst galaxies, ultraluminous galaxies, and protogalaxies. Scheduled for launch in 1998.

¶ Tentative missions pending authorization to proceed. § International Collaboration

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CURRENT RESEARCH TASKS SUPPORTED BY THE INFRARED/SUBMILLIMETER/RADIO ASTROPHYSICS R&A PROGRAM

Detector Development

- Far-infrared semiconductor detectors and materials
- Development of ultra low-noise infrared detectors
- Far-infrared heterodyne receivers using Ga:Ge BIB photodetectors
- SIS mixer and Schottky varactor elements for submm receivers
- THz hot electron receiver development
- Quasi-optical SIS mixer development
- Monolithic silicon bolometer arrays
- Superconducting tunnel junctions

Instrument Technology Development

- Development of lightweight mirrors
- Near-infrared Fabry-Perot spectrometer to conduct Galactic Br α survey
- Development of techniques for etching of immersion diffraction gratings
- Development of imaging Fabry-Perot interferometer for use at submm wavelengths
- Multipurpose, mid-infrared camera development
- Metal-mesh, far-infrared filter technology

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Balloon- and Rocket-Based Programs

- Measurements of cosmic microwave background anisotropies
- Near-infrared, wide-field observations with a sounding rocket payload

Laboratory Astrophysics

- Accurate frequency measurements of transitions in ions, radicals, and molecules of astronomical interest
- Investigation of photoexcitation processes of interstellar molecules, and measurement of photoabsorption and fluorescence cross-sections
- Spectroscopy and modeling of molecules with internal rotation
- Measurements of bulk optical properties for solids of astrophysical interest
- Calculation of molecular collisional excitation rates
- Investigations of hydrogen recombination on surfaces of interstellar grain analogues
- Investigation of carbon clusters and their relationship to interstellar dust
- Spectroscopic studies of the chemical and physical properties of interstellar PAH's and carbonaceous materials
- Submillimeter spectra of atoms, ions, and molecules
- Spectroscopy of short-lived interstellar refractory molecules
- Photodissociation processes in free radical
- Laboratory studies of ices and ice/silicate composites

FORMS FOR USE IN PREPARING PROPOSALS IN RESPONSE TO THIS NRA

Appendix F contains five forms that must be completed and attached to proposals submitted in response to this NRA: (i) cover page, (ii) endorsement page, and (iii) three certification pages.

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APPENDIX F - COVER PAGE

Proposal for Infrared, Submillimeter, and Radio Astronomy

NRA 96-OSS-07

Principal Investigator		
First Name	Middle Name	Last Name
Proposal Title		
Department		
Institution		
Street Address		City/Town
State/County	Zip/Postal Code	Country
Telephone	Telex	Fax
E-Mail Address		

Abstract (800 characters maximum including spaces ~ 150 words)

APPENDIX F - ENDORSEMENT PAGE

Proposal for Infrared, Submillimeter, and Radio Astronomy

NRA 96-OSS-07

Principal Investigator

First Name Middle Name Last Name

Proposal Title

Institutional Endorsement

Name of Official

Administrative Authority

Institution

Signature Date

Co-Investigator(s) Name	Institution

Budget Summary by Government Fiscal Year (starts October 1)

	Year 1 (FY 97)	+ Year 2 (FY 98)	+ Year 3 (FY 99)	= TOTAL
Amount Requested		+	+	=

Certification Regarding Drug-Free Workplace Requirements
Grantees Other Than Individuals

This certification is required by the regulations implementing the Drug-Free Workplace Act of 1988, 34 CFR Part 85, Subpart F. The regulations, published in the January 31, 1989 Federal Register, require certification by grantees, prior to award, that they will maintain a drug-free workplace. The certification set out below is a material representation of fact upon which reliance will be placed when the agency determines to award the grant. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of grants, or governmentwide suspension or debarment (see 34 CFR Part 85, Sections 85.615 and 85.620).

This grantee certifies that it will provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing a drug-free awareness program to inform employees about -

(1) The dangers of drug abuse in the workplace;
(2) The grantee's policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs, and
(4) The penalties that may be imposed upon employees for drug abuse violations in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will -

(1) Abide by the terms of the statement; and
(2) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;

(e) Notifying the agency within ten days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction;

(f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted -

(1) Taking appropriate personnel action against such an employee, up to and including termination; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraph (a), (b), (c), (e), and (f).

Organization Name | PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature | Date

Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211).

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name | PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature | Date

Certification Regarding Lobbying

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000, and not more than $100,000 for each such failure.

Signature and Date

Name and Title of Authorized Representative

Organization Name

PR/Award Number or Proposal Name

NASA Research Announcement (NRA)/Announcement of Opportunity (AO) Mailing List Update

If your current address is NOT up-to-date, please fill out this form completely.

This is the update form for the NASA Office of Space Sciences (OSS) NRA/AO mailing list. Please fill out CONTACT INFORMATION completely. Check only those that apply in Institution Type and Discipline. Fold the form, secure with tape, and mail it back to the address on the reverse side. Proper postage must be applied.

MUST CHECK ONE

Please check which announcements you would like to receive:

- ☐ 1. NASA Research Announcements (basic, non-flight, on-going research)
- ☐ 2. Announcements of Opportunity (specific space flight mission)

Must check one, please include code number from mailing label:

- ☐ 1. Please ***add*** my name to the mailing list.
- ☐ 2. Please ***remove*** my name from the mailing list (please attach mailing label)
- ☐ 3. Please ***update*** my current listing.

CONTACT INFORMATION If your address has changed or your mailing label is incorrect, please provide ***COMPLETE*** contact information.

Code Number: (obtain from mailing label) | Salutation: (Mr.,Mrs.,Ms.,Dr.,Prof.,etc.) | Suffix (Ret.,PhD.,Jr.,III,etc.)

First Name: | MI: | Last Name:

Organization:

Division / Department:

Street:

City: | State: | Zip:

Telephone No: | Fax No:

E-Mail Address: _____ Internet Address: _____

Country: (foreign addresses, please specify)

Institution Type

(check only those that apply)

- ☐ 1. College or University
- ☐ 2. Minority College or University
- ☐ 3. Foreign Addressee
- ☐ 4. Minority Business
- ☐ 5. NASA HQs/Center
- ☐ 6. Nonprofit Corporation
- ☐ 7. Other Government Agency
- ☐ 8. Private Industry
- ☐ 9. Small Business

Societies:

- ☐ A. American Astronomical Society
- ☐ B. American Geophysical Union
- ☐ C. Others _____

Discipline:

(check only those that apply) **(MUST CHECK AT LEAST ONE)**

1. Astronomy and Astrophysics

- ☐ A. Theory and Modeling
- ☐ B. Instrumentation (Technology Dev)
- ☐ C. Laboratory Astrophysics
- ☐ D. Data Analysis (Archival)
- ☐ E. Observational Programs

2. Solar System Exploration

- ☐ A. Planetary Atmospheres and Astronomy
- ☐ B. Planetary Materials and Geochemistry
- ☐ C. Planetary Geology and Geophysics
- ☐ D. Instrument Development
- ☐ E. Origins of Solar Systems
- ☐ F. Exobiology

3. Space Physics

- ☐ A. Cosmic and Heliosphere Physics
- ☐ B. Solar Physics
- ☐ C. Magnetospheric Physics
- ☐ D. Iono-Thermo-Mesosphere Physics

4. Information Systems/Computer Science

- ☐ A. High Performance Computing and Networking
- ☐ B. Scientific Data Analysis and Visualization
- ☐ C. Science Data Storage and Management
- ☐ D. Software Technology

SPI
7/94

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NASA
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END

10-18-96